

Trend Study 17-5-02

Study site name: Deer Creek Dam.

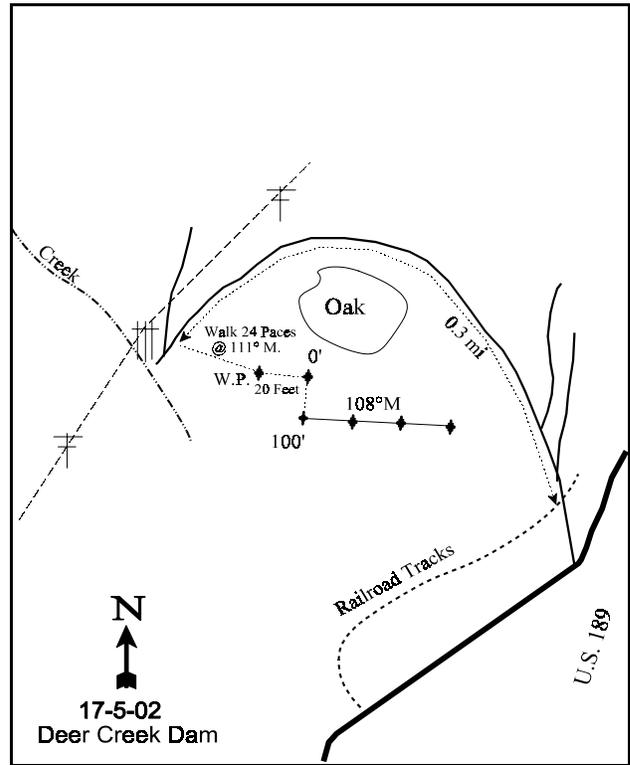
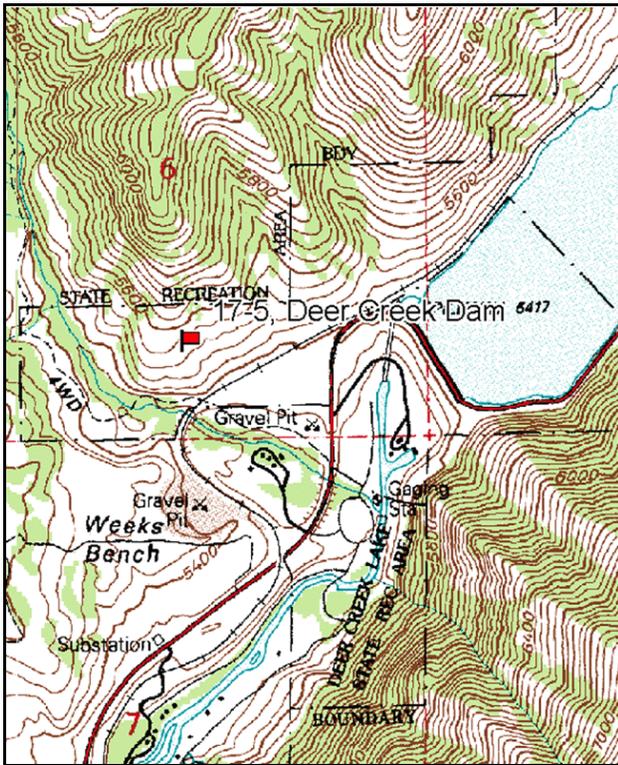
Vegetation type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 180 degrees magnetic (line 2-4 @ 108°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (71ft), line 3 (34ft), line 4 (71ft).

LOCATION DESCRIPTION

From the dam at the south end of Deer Creek Reservoir, proceed south on U.S. 189 for 0.10 miles to an intersection to the west. Turn right toward Deer Creek and proceed northwesterly to the intersection of the Denver and Rio-Grande railroad tracks. Continue for 0.3 miles to a three pole power pole. Walk 29 paces from the pole at an azimuth of 111 degrees magnetic to a full high witness post. The 0-foot baseline stake is 20 feet from the witness post. A red browse tag, number 3914, is attached to the 0-foot baseline stake. Line 4 belt was mistakenly put at 71 feet.



Map Name: Aspen Grove

Diagrammatic Sketch

Township 5S, Range 4E, Section 6

GPS: NAD 27, UTM 12S 4472864 N 454533 E

## DISCUSSION

### Deer Creek Dam - Trend Study No. 17-5

This study is located within deer winter range on a moderately sloping (20%) bench at the mouth of Deer Creek. Elevation is approximately 5,540 feet on a south to southeast exposure. The study is on land administered by the Utah Division of Parks and Recreation about ½ mile west of Deer Creek dam. Power line construction previous to site establishment in 1989 disturbed the ground along the end of the frequency lines. This resulted in many of the mature sagebrush being eliminated and a proliferation of sagebrush seedlings and annual weeds being present in 1989. The range type is big sagebrush-grass which receives moderate deer use in winter and spring. Pellet group transect data collected on the site in 2002 estimated 32 deer days use/acre (79 ddu/ha) and 6 elk days use/acre (15 edu/ha).

Soil is alluvially deposited from sedimentary parent material. It has a clay loam texture. Soils are moderately deep with an effective rooting depth estimated at nearly 14 inches. However, the profile is very rocky especially in the upper 12 inches. A calcium carbonate layer is present 9 inches below the surface. Erosion potential is moderate on the site. In 2002, bare soil increased to 17% due to a decrease in herbaceous and litter cover. Even with the decline, vegetation and litter cover are still abundant and help minimize soil loss. An erosion condition class assessment done in 2002 gave soils a stable rating.

Mountain big sagebrush represents the key browse on this study. Density has been sporadic between years, but most of the change in numbers can be attributed to the greatly increased sample size used in 1996 and 2002 which is more accurate at determining shrub densities. Density was estimated at 4,120 plants/acre in 1996, increasing to 5,320 plants/acre in 2002. The increase appears to be due to many of the young plants in 1996 (1,560 plants/acre) attaining maturity. Recruitment by young plants decreased in 2002, but is still moderate at 800 plants/acre (15% of the population). Due to the construction of a power line prior to the 1989 sampling, sagebrush seedlings were estimated at 21,000 plants/acre. This number declined to 2,020 plants/acre in 1996 with no seedlings being sampled in 2002. Percent decadence has been low in most years and is currently ('02) at 15%. Vigor improved between 1996 and 2002 with only 5% of the population being rated as poor. Utilization was moderate to heavy in 1983, but has since been mostly light to moderate. It was noted in 2002 that many of the mature plants have a smaller growth form, probably due to intraspecific competition with other sagebrush plants. In 1996, it was reported that a portion of the population located further downslope appeared to have some crown death, possibly associated with insects or rodents. In 2002, the sagebrush was vigorous with annual leader growth averaging 3.3 inches.

Low rabbitbrush had an estimated density of 2,060 plants/acre in 1996, decreasing to 1,760 plants/acre in 2002. The population is mostly mature with no young plants sampled in 2002. Very few plants showed utilization in any reading. Broom snakeweed density was estimated at 1,140 plants/acre in 1996, increasing to 2,940 plants/acre in 2002. This increase is somewhat surprising during a drought year as snakeweed often decreases during dry conditions. Other species encountered in low densities included: chokecherry, bitterbrush, snowberry, serviceberry, and white-stemmed rubber rabbitbrush.

The herbaceous understory is weedy in composition with cheatgrass providing the bulk of the herbaceous cover in 1996. Cheatgrass was sampled in 96% of the quadrats in 1996, with a cover value of 19%, and a nested frequency value of 356 out of a possible 400. Due to the dry conditions in 2002, cheatgrass significantly decreased in nested frequency and was sampled in only 52% of the quadrats. Average cover declined to only about 2%. It only contributed 25% of the total grass cover compared to 86% in 1996. Even with drought, cheatgrass remains abundant enough to dominate the site when precipitation conditions are right. The perennial grass component is poor with Kentucky bluegrass and bluebunch wheatgrass being the most abundant species. Bluebunch wheatgrass has slowly increased with every reading, while Kentucky

bluegrass has steadily declined. Sum of nested frequency of perennial grasses decreased by 10% in 2002. This decline is likely a combination of drought in 2002, as well as the dense browse component that may be starting to have a negative impact on the herbaceous understory.

Many of the forbs encountered are increasers and weeds, including both annuals and biennials. Dalmation toad flax, thistle, houndstongue, yellow salsify, and bur buttercup are examples of these. The most abundant forb is longleaf phlox. Utah sweetvetch, a valuable forb, showed an increase in nested frequency between 1989 and 1996, but was not sampled in 2002. Perennial forbs showed a 20% decrease in sum of nested frequency in 2002.

#### 1983 APPARENT TREND ASSESSMENT

Soil appears stable on the study site proper, but appears to be declining on nearby steeper slopes. The predominant plant cover is annual vegetation, which on these slopes is inadequate to prevent soil loss. Sagebrush appears to have a stable population but there are concerns with its vigor. Perennial grasses and forbs are not abundant and the site is dominated by annual species.

#### 1989 TREND ASSESSMENT

Soil trend is stable. The slight changes in ground cover percentages cannot be interpreted as a downward trend, since they were a result of disturbance from the power line corridor. Bare soil remains low at 5%. Trend for browse is difficult to determine because of the loss of sagebrush plants due to the power line disturbance. Although density declined, the abundance of seedling plants is positive. Trend is considered slightly down. Trend for the herbaceous understory is stable overall. Sum of nested frequency more than doubled for perennial grasses, but decreased for perennial forbs.

##### TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - stable (3)

#### 1996 TREND ASSESSMENT

Soil trend is stable at this time with abundant vegetation and litter cover. Bare soil remains relatively low at 6%. In 1983, mountain big sagebrush was reported as having generally poor vigor. The mountain big sagebrush population now appears to be healthy with mostly light hedging and generally good vigor. Some surrounding sagebrush showed partial crown death, but this is very limited. Due to the increased vigor of mountain big sagebrush, and because other species appear to be stable, the browse trend is considered upward. Herbaceous understory has poor composition at this time and is dominated by cheatgrass. Many of the abundant forbs are annuals or biennials and are considered weeds and increasers. Perennial species are found scattered throughout the site in low abundance. Because annual species were not recorded in the past, it is difficult to give a trend assessment for the herbaceous understory. Trend for perennial species is stable for now and the health of this site is dependant on these species. Because of the fine fuels contributed by the abundant annuals in the understory, this site has the potential to carry a fire that would eliminate the browse.

##### TREND ASSESSMENT

soil - stable (3)

browse - upward (5)

herbaceous understory - stable (3), but composition is poor

2002 TREND ASSESSMENT

Trend for soil is down slightly. Bare soil increased from 6% to 17%, litter cover declined and total herbaceous cover declined from 33% to 16%. However, protective cover remains good and an erosion condition class assessment indicated soils to be stable with only minimal erosion. Trend for browse is slightly up. Mountain big sagebrush increased in density and shows improved vigor. Decadence slightly increased, but only to 15% of the population. Recruitment by young plants is moderate at 15%. Further increases in density may start to negatively impact the herbaceous understory. The herbaceous component has a slightly downward trend. Sum of nested frequency decreased for both perennial grasses and forbs. This decline is most likely due to a combination of drought and an increasing dominance of mountain big sagebrush which has a total canopy cover value estimated at nearly 25%. The herbaceous composition still includes many annual and biennial weeds.

TREND ASSESSMENT

soil - down slightly (2)

browse - slightly up (4)

herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 5

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'96	'02	'83	'89	'96	'02	'96	'02
G	<i>Aegilops cylindrica</i> (a)	-	-	-	3	-	-	-	2	-	.03
G	<i>Agropyron cristatum</i>	-	-	-	3	-	-	-	1	-	.03
G	<i>Agropyron spicatum</i>	<sub>a</sub> 5	<sub>b</sub> 37	<sub>bc</sub> 70	<sub>c</sub> 93	3	16	25	39	2.07	2.19
G	<i>Bromus japonicus</i> (a)	-	-	<sub>a</sub> -	<sub>b</sub> 171	-	-	-	69	-	1.43
G	<i>Bromus tectorum</i> (a)	-	-	<sub>b</sub> 356	<sub>a</sub> 125	-	-	96	52	19.20	1.63
G	<i>Elymus cinereus</i>	-	-	5	-	-	-	2	-	.18	.00
G	<i>Melica bulbosa</i>	-	-	3	7	-	-	1	3	.00	.21
G	<i>Oryzopsis hymenoides</i>	-	-	-	3	-	-	-	1	-	.15
G	<i>Poa fendleriana</i>	<sub>ab</sub> 3	<sub>b</sub> 10	<sub>a</sub> -	<sub>a</sub> -	1	5	-	-	-	-
G	<i>Poa pratensis</i>	<sub>b</sub> 96	<sub>c</sub> 164	<sub>b</sub> 92	<sub>a</sub> 43	35	62	34	22	1.24	.52
G	<i>Poa secunda</i>	1	3	-	1	1	1	-	1	-	.00
G	<i>Sitanion hystrix</i>	-	-	-	3	-	-	-	1	-	.03
Total for Annual Grasses		0	0	356	299	0	0	96	123	19.20	3.11
Total for Perennial Grasses		105	214	170	153	40	84	62	68	3.50	3.15
Total for Grasses		105	214	526	452	40	84	158	191	22.70	6.26
F	<i>Alyssum alyssoides</i> (a)	-	-	<sub>a</sub> 96	<sub>b</sub> 157	-	-	32	63	.36	.81
F	<i>Allium</i> spp.	<sub>bc</sub> 31	<sub>a</sub> 9	<sub>ab</sub> 16	<sub>c</sub> 46	12	4	7	18	.06	.44
F	<i>Artemisia ludoviciana</i>	3	-	6	6	1	-	2	3	.06	.21
F	<i>Astragalus beckwithii</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 24	-	-	-	12	-	.78
F	<i>Astragalus convallarius</i>	13	5	24	25	6	3	10	11	.24	.50

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'96	'02	'83	'89	'96	'02	'96	'02
F	<i>Astragalus utahensis</i>	-	-	-	1	-	-	-	1	-	.00
F	<i>Camelina microcarpa</i> (a)	-	-	-	3	-	-	-	1	-	.03
F	<i>Calochortus nuttallii</i>	<sub>b</sub> 14	<sub>ab</sub> 3	<sub>a</sub> -	<sub>ab</sub> 7	7	3	-	4	-	.02
F	<i>Cirsium undulatum</i>	<sub>a</sub> 21	<sub>a</sub> 12	<sub>b</sub> 47	<sub>a</sub> 20	9	9	25	9	.82	.35
F	<i>Collomia linearis</i> (a)	-	-	-	9	-	-	-	4	-	.02
F	<i>Comandra pallida</i>	-	-	2	3	-	-	1	2	.00	.01
F	<i>Collinsia parviflora</i> (a)	-	-	-	2	-	-	-	1	-	.00
F	<i>Cynoglossum officinale</i>	<sub>a</sub> -	<sub>a</sub> 2	<sub>b</sub> 37	<sub>a</sub> -	-	1	16	-	2.34	-
F	<i>Eriogonum brevicaulis</i>	-	7	6	1	-	3	2	1	.18	.00
F	<i>Erodium cicutarium</i> (a)	-	-	-	11	-	-	-	3	-	.09
F	<i>Galium</i> spp.	-	-	<sub>b</sub> 147	<sub>a</sub> 60	-	-	50	26	1.05	1.14
F	<i>Gayophytum ramosissimum</i> (a)	-	-	<sub>b</sub> 20	<sub>a</sub> 3	-	-	8	1	.04	.00
F	<i>Hackelia patens</i>	-	3	-	-	-	1	-	-	-	-
F	<i>Helianthus annuus</i> (a)	-	1	-	5	-	1	-	2	-	.03
F	<i>Hedysarum boreale</i>	<sub>c</sub> 69	<sub>b</sub> 13	<sub>b</sub> 28	<sub>a</sub> -	35	8	15	-	.63	-
F	<i>Lactuca serriola</i>	<sub>a</sub> -	<sub>b</sub> 20	<sub>b</sub> 17	<sub>a</sub> 3	-	9	9	2	.04	.01
F	<i>Linaria dalmanica</i>	<sub>a</sub> -	<sub>a</sub> -	<sub>b</sub> 52	<sub>b</sub> 41	-	-	23	18	.85	1.37
F	<i>Lithospermum ruderale</i>	1	3	6	6	1	1	3	2	.44	.18
F	<i>Lupinus argenteus</i>	<sub>a</sub> 8	<sub>ab</sub> 1	<sub>ab</sub> 2	<sub>a</sub> -	3	1	2	-	.15	.16
F	<i>Machaeranthera canescens</i>	2	5	1	-	1	2	1	-	.00	.03
F	<i>Melilotus officinalis</i>	-	-	9	-	-	-	3	-	.04	-
F	<i>Microsteris gracilis</i> (a)	-	-	-	4	-	-	-	2	-	.01
F	<i>Oenothera</i> spp.	<sub>a</sub> 4	<sub>b</sub> 10	<sub>a</sub> 3	<sub>a</sub> -	1	7	1	-	.00	-
F	<i>Phlox longifolia</i>	<sub>a</sub> 26	<sub>a</sub> 15	<sub>b</sub> 109	<sub>b</sub> 123	12	9	39	43	2.21	2.59
F	<i>Ranunculus testiculatus</i> (a)	-	-	12	30	-	-	7	11	.06	.13
F	<i>Solidago</i> spp.	3	-	-	-	1	-	-	-	-	-
F	<i>Tragopogon dubius</i>	<sub>a</sub> -	<sub>b</sub> 10	<sub>c</sub> 61	<sub>d</sub> 92	-	7	24	49	.39	1.08
Total for Annual Forbs		0	1	128	224	0	1	47	88	0.45	1.13
Total for Perennial Forbs		195	118	573	458	89	68	233	201	9.56	8.91
Total for Forbs		195	119	701	682	89	69	280	289	10.02	10.05

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --  
Herd unit 17 , Study no: 5

Type	Species	Strip Frequency		Average Cover %	
		'96	'02	'96	'02
B	<i>Acer grandidentatum</i>	0	1	-	-
B	<i>Amelanchier alnifolia</i>	2	3	-	.53
B	<i>Artemisia tridentata vaseyana</i>	78	82	20.79	23.60
B	<i>Chrysothamnus nauseosus albicaulis</i>	18	16	.90	.58
B	<i>Chrysothamnus viscidiflorus viscidiflorus</i>	39	31	3.54	1.55
B	<i>Crataegus douglasii</i>	0	1	-	-
B	<i>Gutierrezia sarothrae</i>	26	40	.32	1.21
B	<i>Mahonia repens</i>	0	10	-	.36
B	<i>Prunus virginiana</i>	3	11	.36	.63
B	<i>Purshia tridentata</i>	2	1	.15	-
B	<i>Rosa woodsii</i>	0	2	-	-
B	<i>Symphoricarpos oreophilus</i>	19	17	3.25	3.36
Total for Browse		187	215	29.33	31.84

CANOPY COVER -- LINE INTERCEPT  
Herd unit 17 , Study no: 5

Species	Percent Cover	
	'96	'02
<i>Amelanchier utahensis</i>	-	.17
<i>Artemisia tridentata vaseyana</i>	-	24.83
<i>Chrysothamnus nauseosus hololeucus</i>	-	1.33
<i>Chrysothamnus viscidiflorus viscidiflorus</i>	-	1.50
<i>Gutierrezia sarothrae</i>	-	2.58
<i>Mahonia repens</i>	-	.67
<i>Prunus virginiana</i>	-	.92
<i>Symphoricarpos oreophilus</i>	-	4.92

Key Browse Annual Leader Growth  
Herd unit 17 , Study no: 5

Species	Average leader growth (in)
	'02
<i>Artemisia tridentata vaseyana</i>	3.4

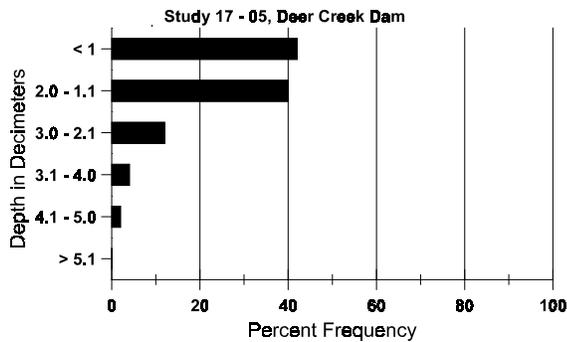
BASIC COVER --  
Herd unit 17 , Study no: 5

Cover Type	Nested Frequency		Average Cover %			
	'96	'02	'83	'89	'96	'02
Vegetation	395	341	4.25	9.25	56.32	46.84
Rock	200	146	1.25	1.75	5.36	3.31
Pavement	219	238	5.50	15.25	5.72	6.73
Litter	397	379	82.75	68.50	57.25	45.51
Cryptogams	-	-	.25	0	0	0
Bare Ground	198	221	6.00	5.25	6.69	17.03

SOIL ANALYSIS DATA --  
Herd Unit 17, Study no: 05, Deer Creek Dam

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.8	66.2 (14.0)	7.3	29.3	42.7	28.0	3.3	12.9	150.4	.7

### Stoniness Index



PELLET GROUP FREQUENCY --  
Herd unit 17 , Study no: 5

Type	Quadrat Frequency	
	'96	'02
Elk	1	3
Deer	15	11

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
02	02
78	6 (15)
418	32 (79)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 5

A G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.			Total
		1	2	3	4	5	6	7	8	9	1	2	3	4					
<i>Acer grandidentatum</i>																			
M	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'02	2	-	-	-	-	-	-	-	-	2	-	-	-	40	15	6	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'83		00%			00%			00%											
'89		00%			00%			00%											
'96		00%			00%			00%											
'02		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-				
												'89	0		-				
												'96	0		-				
												'02	40		-				
<i>Amelanchier alnifolia</i>																			
M	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	'96	-	-	1	-	-	-	-	-	-	1	-	-	-	20	25	26	1	
	'02	-	-	1	-	-	-	1	-	-	2	-	-	-	40	52	46	2	
D	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	'89	-	-	1	-	-	-	-	-	-	-	-	1	-	66			1	
	'96	-	-	1	-	-	-	-	-	-	-	-	1	-	20			1	
	'02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'83		00%			00%			00%											
'89		00%			100%			100%			-39%								
'96		00%			100%			50%			+33%								
'02		00%			33%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	0%				
												'89	66		100%				
												'96	40		50%				
												'02	60		33%				

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'89	315	-	-	-	-	-	-	-	-	315	-	-	-	21000		315	
	'96	96	3	-	2	-	-	-	-	-	98	-	3	-	2020		101	
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	'83	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'89	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	'96	76	1	-	1	-	-	-	-	-	78	-	-	-	1560		78	
	'02	40	-	-	-	-	-	-	-	-	40	-	-	-	800		40	
M	'83	16	8	3	-	-	-	-	-	-	16	-	11	-	1800	23 33	27	
	'89	13	-	-	-	-	-	-	-	-	13	-	-	-	866	27 41	13	
	'96	76	30	4	1	-	-	-	-	-	96	2	13	-	2220	24 39	111	
	'02	146	35	4	-	-	-	-	-	-	176	9	-	-	3700	24 28	185	
D	'83	1	4	4	-	-	-	-	-	-	-	-	9	-	600		9	
	'89	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	'96	11	6	-	-	-	-	-	-	-	2	-	4	11	340		17	
	'02	27	4	-	1	6	2	1	-	-	27	1	-	13	820		41	
X	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'96	-	-	-	-	-	-	-	-	-	-	-	-	-	440		22	
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	880		44	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		32%			18%			53%			-53%							
'89		00%			00%			00%			+71%							
'96		18%			02%			14%			+23%							
'02		17%			02%			05%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	2533	Dec:	24%			
												'89	1199		11%			
												'96	4120		8%			
												'02	5320		15%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total								
		1	2	3	4		1	2									
Chrysothamnus nauseosus albicaulis																	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	4	-	-	-	-	-	-	-	4	-	-	-	80		4	
	02	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	1	-	-	-	-	-	-	-	1	-	-	-	66	21	27	1
	96	12	1	6	1	-	-	-	-	17	-	2	1	400	23	26	20
	02	18	-	-	-	-	-	-	-	17	-	1	-	360	17	20	18
D	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	5	-	-	-	-	-	-	-	1	-	1	3	100		5	
	02	7	-	-	1	-	-	-	-	3	-	-	5	160		8	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	02	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
'83		00%			00%			00%									
'89		00%			00%			00%			+89%						
'96		03%			21%			24%			-10%						
'02		00%			00%			23%									
Total Plants/Acre (excluding Dead & Seedlings)										'83	0	Dec:	0%				
										'89	66		0%				
										'96	580		17%				
										'02	520		31%				

A Y G R E	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total																																																																																				
	1	2	3	4	5	6	7	8	9	1	2	3	4																																																																																							
Chrysothamnus viscidiflorus viscidiflorus																																																																																																				
S	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	96	6	-	-	-	-	-	-	-	-	-	-	-	120		6																																																																																				
	02	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	96	14	-	-	-	-	-	-	-	-	-	-	-	280		14																																																																																				
	02	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
M	83	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0																																																																																				
	89	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0																																																																																				
	96	74	10	-	4	1	-	-	-	-	-	-	-	1780	12	21																																																																																				
	02	83	-	-	3	-	-	-	-	-	-	-	-	1720	12	17																																																																																				
D	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	96	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	02	2	-	-	-	-	-	-	-	-	-	-	1	40		2																																																																																				
X	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	96	-	-	-	-	-	-	-	-	-	-	-	-	0		0																																																																																				
	02	-	-	-	-	-	-	-	-	-	-	-	-	20		1																																																																																				
<table border="0" style="width:100%"> <tr> <td>% Plants Showing</td> <td><u>Moderate Use</u></td> <td><u>Heavy Use</u></td> <td><u>Poor Vigor</u></td> <td><u>%Change</u></td> <td colspan="12"></td> </tr> <tr> <td>'83</td> <td>00%</td> <td>00%</td> <td>00%</td> <td></td> <td colspan="12"></td> </tr> <tr> <td>'89</td> <td>00%</td> <td>00%</td> <td>00%</td> <td></td> <td colspan="12"></td> </tr> <tr> <td>'96</td> <td>11%</td> <td>00%</td> <td>00%</td> <td>-15%</td> <td colspan="12"></td> </tr> <tr> <td>'02</td> <td>00%</td> <td>00%</td> <td>01%</td> <td></td> <td colspan="12"></td> </tr> </table>																% Plants Showing	<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>													'83	00%	00%	00%														'89	00%	00%	00%														'96	11%	00%	00%	-15%													'02	00%	00%	01%													
% Plants Showing	<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>																																																																																																
'83	00%	00%	00%																																																																																																	
'89	00%	00%	00%																																																																																																	
'96	11%	00%	00%	-15%																																																																																																
'02	00%	00%	01%																																																																																																	
<table border="0" style="width:100%"> <tr> <td>Total Plants/Acre (excluding Dead &amp; Seedlings)</td> <td></td> </tr> <tr> <td></td> </tr> <tr> <td></td> </tr> <tr> <td></td> </tr> </table>																Total Plants/Acre (excluding Dead & Seedlings)																																																																																				
Total Plants/Acre (excluding Dead & Seedlings)																																																																																																				
Crataegus douglasii																																																																																																				
M	83	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0																																																																																				
	89	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0																																																																																				
	96	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0																																																																																				
	02	-	-	2	-	-	-	-	-	-	-	-	-	40	28	40																																																																																				
<table border="0" style="width:100%"> <tr> <td>% Plants Showing</td> <td><u>Moderate Use</u></td> <td><u>Heavy Use</u></td> <td><u>Poor Vigor</u></td> <td><u>%Change</u></td> <td colspan="12"></td> </tr> <tr> <td>'83</td> <td>00%</td> <td>00%</td> <td>00%</td> <td></td> <td colspan="12"></td> </tr> <tr> <td>'89</td> <td>00%</td> <td>00%</td> <td>00%</td> <td></td> <td colspan="12"></td> </tr> <tr> <td>'96</td> <td>00%</td> <td>00%</td> <td>00%</td> <td></td> <td colspan="12"></td> </tr> <tr> <td>'02</td> <td>00%</td> <td>100%</td> <td>00%</td> <td></td> <td colspan="12"></td> </tr> </table>																% Plants Showing	<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>													'83	00%	00%	00%														'89	00%	00%	00%														'96	00%	00%	00%														'02	00%	100%	00%													
% Plants Showing	<u>Moderate Use</u>	<u>Heavy Use</u>	<u>Poor Vigor</u>	<u>%Change</u>																																																																																																
'83	00%	00%	00%																																																																																																	
'89	00%	00%	00%																																																																																																	
'96	00%	00%	00%																																																																																																	
'02	00%	100%	00%																																																																																																	
<table border="0" style="width:100%"> <tr> <td>Total Plants/Acre (excluding Dead &amp; Seedlings)</td> <td></td> </tr> <tr> <td></td> </tr> <tr> <td></td> </tr> <tr> <td></td> </tr> </table>																Total Plants/Acre (excluding Dead & Seedlings)																																																																																				
Total Plants/Acre (excluding Dead & Seedlings)																																																																																																				

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total										
		1	2	3	4		1	2											
<b>Gutierrezia sarothrae</b>																			
S	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	89	2	-	-	-	-	-	-	-	2	-	-	-	133		2			
	96	30	-	-	-	-	-	-	-	30	-	-	-	600		30			
	02	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	96	17	-	-	-	-	-	-	-	17	-	-	-	340		17			
	02	4	-	-	-	-	-	-	-	4	-	-	-	80		4			
M	83	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-			
	89	1	-	-	-	-	-	-	-	1	-	-	-	66	19	20			
	96	36	-	1	-	1	-	-	-	37	-	-	1	760	6	9			
	02	127	-	-	5	-	-	-	-	132	-	-	-	2640	10	13			
D	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	96	2	-	-	-	-	-	-	-	-	-	-	2	40		2			
	02	10	-	-	-	-	1	-	-	7	-	-	4	220		11			
X	83	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	89	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	96	-	-	-	-	-	-	-	-	-	-	-	-	0		0			
	02	-	-	-	-	-	-	-	-	-	-	-	-	320		16			
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>											
'83		00%		00%		00%													
'89		00%		00%		00%		+94%											
'96		02%		02%		05%		+61%											
'02		00%		00%		03%													
Total Plants/Acre (excluding Dead & Seedlings)										'83	0	Dec:	0%						
										'89	66		0%						
										'96	1140		4%						
										'02	2940		7%						
<b>Mahonia repens</b>																			
M	83	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-			
	89	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-			
	96	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-			
	02	259	-	-	-	-	-	-	-	259	-	-	-	5180	4	5			
% Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>		<u>%Change</u>											
'83		00%		00%		00%													
'89		00%		00%		00%													
'96		00%		00%		00%													
'02		00%		00%		00%													
Total Plants/Acre (excluding Dead & Seedlings)										'83	0	Dec:	-						
										'89	0		-						
										'96	0		-						
										'02	5180		-						

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
<i>Prunus virginiana</i>																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	96	21	-	-	-	-	-	-	-	-	-	-	-	420			21	
	02	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	4	-	-	-	-	-	-	-	-	-	-	-	266			4	
	96	14	-	-	-	-	-	-	-	-	-	-	-	280			14	
	02	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	96	-	2	-	-	-	-	-	-	-	-	-	-	40	46	23	2	
	02	6	3	23	-	-	-	-	-	-	-	-	-	640	11	8	32	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	96	-	-	-	-	1	-	-	-	-	-	-	-	0			0	
	02	-	-	-	-	1	-	-	-	-	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			00%			00%			+17%							
'96		13%			00%			00%			+53%							
'02		12%			68%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	0%			
												'89	266		0%			
												'96	320		0%			
												'02	680		3%			
<i>Purshia tridentata</i>																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	96	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
	02	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	96	1	-	-	-	-	-	-	-	-	-	-	-	20			1	
	02	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	96	-	4	-	-	-	-	-	-	-	-	-	-	80	14	42	4	
	02	-	1	-	-	-	-	-	-	-	-	-	-	20	19	33	1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			00%			00%										
'96		80%			00%			00%			-80%							
'02		100%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	0		-			
												'96	100		-			
												'02	20		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total										
		1	2	3	4	5	6	7	8	9	1	2	3	4														
Quercus gambelii																												
M	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0										
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0										
	'96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0										
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	37	27	0										
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>																	
'83		00%			00%			00%																				
'89		00%			00%			00%																				
'96		00%			00%			00%																				
'02		00%			00%			00%																				
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-													
												'89	0		-													
												'96	0		-													
												'02	0		-													
Rosa woodsii																												
Y	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0										
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0										
	'96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0										
	'02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2										
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>																	
'83		00%			00%			00%																				
'89		00%			00%			00%																				
'96		00%			00%			00%																				
'02		00%			00%			00%																				
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-													
												'89	0		-													
												'96	0		-													
												'02	40		-													

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	19	2	3	-	-	-	-	-	-	24	-	-	-	480	25	33	24
	02	16	2	1	-	-	-	-	-	-	19	-	-	-	380	25	31	19
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	3	-	1	-	-	-	-	-	-	4	-	-	-	80		4	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		100%			00%			00%			+88%							
'96		07%			11%			00%			-11%							
'02		08%			08%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	0%			
												'89	66		100%			
												'96	540		0%			
												'02	480		17%			